[0024] In an embodiment of the present invention, herein the communicating unit broadcasts the coordinates corresponding to the current position of the mobile device to the adjacent mobile devices.

[0025] In an embodiment of the present invention, wherein the communicating unit transmits the coordinates corresponding to the current position of the mobile device along with the coordinates of each of the adjacent mobile devices to a base station if the base station is within a predetermined distance from the mobile device.

[0026] In an embodiment of the present invention, further comprising: a location tracking unit configured to be turned on if the mobile device fails to receive the coordinates of each of the adjacent mobile devices so as to acquire the coordinates corresponding to the current location and wherein the communicating unit broadcasts the acquired coordinates to the adjacent mobile devices.

[0027] In an embodiment of the present invention, wherein the location tacking unit is turned off if the acquired coordinates have been broadcast to the adjacent mobile devices.

[0028] In an embodiment of the present invention, wherein the communicating unit receives the coordinates of each of the adjacent mobile devices via a D2D communications channel based on a LTE link.

[0029] According to another aspect of the present invention, there is provided a mobile device, comprising: at least one processor, a memory configured to load a program executed by the processor and storage configured to store a computer program capable of tracking a user's location, wherein the computer program causes the processor to perform the operations of: receiving coordinates of each of adjacent mobile devices therefrom, estimating a channel environment to select an optimal channel model, calculating distance between the mobile device and each of the adjacent mobile devices based on the selected channel model and calculating coordinates corresponding to a current position of the mobile device based on the distance between the mobile device and each of the adjacent mobile devices.

[0030] According to another aspect of the present invention, there is provided a non-transitory computer readable storage medium storing a computer program therein, the computer program causes a computer device in a mobile device to perform the operations of: receiving coordinates of each of adjacent mobile devices therefrom, estimating a channel environment to select an optimal channel model, calculating distance between the mobile device and each of the adjacent mobile devices based on the selected channel model and calculating coordinates corresponding to a current position of the mobile device based on the distance between the mobile device and each of the adjacent mobile devices.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] The above and other aspects and features of the present invention will become more apparent by describing in detail exemplary embodiments thereof with reference to the attached drawings, in which:

[0032] FIG. **1** is a diagram for illustrating a method of tracking a user's location according to an exemplary embodiment of the present disclosure;

[0033] FIG. **2** is a flowchart illustrating a method of tracking a user's location according to an exemplary embodiment of the present disclosure;

[0034] FIG. **3** is a diagram illustrating a way of estimating a propagation environment to select an optimal channel model for the environment according to an exemplary embodiment of the present disclosure;

[0035] FIG. **4** is a diagram illustrating processes of calculating distances between a target mobile device and each of adjacent mobile devices by using a selected channel model according to an exemplary embodiment of the present disclosure;

[0036] FIG. **5** is a diagram illustrating processes of calculating coordinates corresponding to the current location of a target mobile device by using distance between the target mobile device and each of adjacent mobile devices according to an exemplary embodiment of the present disclosure;

[0037] FIG. **6** is a flowchart for illustrating processes carried out when the coordinates of each of adjacent mobile devices are not received therefrom according to an exemplary embodiment of the present disclosure;

[0038] FIG. **7** is a diagram illustrating processes of transmitting broadcast coordinates of a mobile device to a base station via other mobile devices according to an exemplary embodiment of the present disclosure;

[0039] FIG. **8** is a flowchart illustrating processes of transmitting coordinates of the mobile device described above with respect to FIG. **7**;

[0040] FIG. **9** is a block diagram illustrating a mobile device according to an exemplary embodiment of the present disclosure; and

[0041] FIG. **10** is a block diagram illustrating a mobile device according to still another exemplary embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0042] Advantages and features of the present invention and methods of accomplishing the same may be understood more readily by reference to the following detailed description of preferred embodiments and the accompanying drawings. The present invention may, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete and will fully convey the concept of the invention to those skilled in the art, and the present invention will only be defined by the appended claims. Like numbers refer to like elements throughout.

[0043] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and the present disclosure, and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0044] In addition, it will be understood that the singular forms are intended to include the plural forms as well. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, operations, elements, and/or components thereof.